

In re Patent Application of:
NG ET AL.
Serial No. 10/038,848
Filing Date: DECEMBER 31, 2001

In the Claims:

1. (Currently Amended) An audio amplifier device comprising:

a power supply including an output for providing a supply voltage;

a voltage divider connected to the output of said power supply for providing a divided supply voltage;

an audio amplifier comprising a supply voltage rejection circuit and including a first input for receiving an input audio signal, a second input for receiving the supply voltage, a third input for receiving a supply voltage rejection signal for said supply voltage rejection circuit, and an output for providing an output audio signal; and

a speaker connected to the output of said audio amplifier; and

a power-off noise suppression circuit having a first input for receiving the divided supply voltage and an output for providing the supply voltage rejection signal, said power-off noise suppression circuit setting the supply voltage rejection signal equal to the divided supply voltage during power-off of said power supply so that a rate of decrease of the supply voltage is greater than a rate of decrease of the supply voltage rejection signal ~~for reducing noise in the output audio signal during the power-off.~~

2. (Currently Amended) An audio amplifier device according to Claim 1 wherein said supply voltage rejection circuit comprises at least one transistor having a conducting voltage; and wherein the rate of decrease of the supply voltage ~~is greater than~~ and the rate of decrease of the supply

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voltage rejection signal cause an instantaneous supply voltage to be greater than an instantaneous supply voltage rejection signal by at least the conducting voltage.

3. (Original) An audio amplifier device according to Claim 1 wherein said power-off noise suppression circuit includes a second input connected to the output thereof so that said power-off noise suppression circuit is configured as a voltage follower.

4. (Currently Amended) An audio amplifier device according to Claim 1 wherein said power-off noise suppression circuit comprises:

a pair of first and second transistors each comprising a first conduction terminal connected to said power supply, said first transistor comprising a control terminal connected to the first input of said power-off noise suppression circuit and said second transistor comprising a control terminal connected to the third input of said audio amplifier for providing the supply voltage rejection signal; and

a device connected to said pair of first and second transistors and being operated when so that ~~the divided supply voltage is greater than the supply voltage rejection signal during power-off so that the~~ supply voltage rejection signal is set equal to the divided supply voltage.

5. (Currently Amended) An audio amplifier device according to Claim 4 wherein said power-off noise suppression

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circuit further comprises a bias circuit connected to said ~~switch~~ device.

6. (Original) An audio amplifier device according to Claim 5 wherein said bias circuit comprises a resistor.

7. (Currently Amended) An audio amplifier device according to Claim 4 wherein said ~~switch~~ device comprises a transistor.

8. (Currently Amended) An audio amplifier device according to Claim 7 wherein said ~~switch~~ device comprises an NPN transistor.

9. (Original) An audio amplifier device according to Claim 4 wherein said pair of first and second transistors each comprises a PNP transistor.

10. (Original) An audio amplifier device according to Claim 1 wherein said audio amplifier is a Class B amplifier.

11. (Currently Amended) An audio amplifier device comprising:

an audio amplifier comprising a supply voltage rejection circuit and including a first input for receiving an input audio signal, a second input for receiving a supply voltage, a third input for receiving a supply voltage rejection signal for said supply voltage rejection circuit, and an output for providing an output audio signal; and

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a power-off noise suppression circuit having a first input for receiving a divided supply voltage, an output for providing the supply voltage rejection signal, and a second input connected to the output so that said power-off noise suppression circuit is configured as a voltage follower, said power-off noise suppression circuit setting the supply voltage rejection signal equal to the divided supply voltage during power-off so that a rate of decrease of the supply voltage is greater than a rate of decrease of the supply voltage rejection signal ~~for reducing noise in the output audio signal during the power-off.~~

12. (Original) An audio amplifier device according to Claim 11 further comprising:

a power supply including an output for providing the supply voltage; and

a voltage divider connected to the output of said power supply for providing the divided supply voltage.

13. (Original) An audio amplifier device according to Claim 11 further comprising a speaker connected to the output of said audio amplifier.

14. (Currently Amended) An audio amplifier device according to Claim 11 wherein said supply voltage rejection circuit comprises at least one transistor having a conducting voltage; and wherein the rate of decrease of the supply voltage ~~is greater than~~ and the rate of decrease of the supply voltage rejection signal causes an instantaneous supply

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voltage to be greater than an instantaneous supply voltage rejection signal by at least the conducting voltage.

15. (Currently Amended) An audio amplifier device according to Claim 11 wherein said power-off noise suppression circuit comprises:

a pair of first and second transistors each comprising a first conduction terminal for receiving the supply voltage, said first transistor comprising a control terminal connected to the first input of said power-off noise suppression circuit and said second transistor comprising a control terminal connected to the third input of said audio amplifier for providing the supply voltage rejection signal; and

a device connected to said pair of first and second transistors and being operated so that ~~when the divided supply voltage is greater than the~~ supply voltage rejection signal ~~during power-off so that the supply voltage rejection signal~~ is set equal to the divided supply voltage.

16. (Original) An audio amplifier device according to Claim 15 wherein said power-off noise suppression circuit further comprises a bias circuit connected to said switch.

17. (Currently Amended) An audio amplifier device according to ~~Claim 6~~ Claim 16 wherein said bias circuit comprises a resistor.

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18. (Currently Amended) An audio amplifier device according to Claim 15 wherein said ~~switch~~ device comprises a transistor.

19. (Currently Amended) An audio amplifier device according to Claim 18 wherein said ~~switch~~ device comprises an NPN transistor.

20. (Original) An audio amplifier device according to Claim 15 wherein said pair of first and second transistors each comprises a PNP transistor.

21. (Original) An audio amplifier device according to Claim 11 wherein said audio amplifier is a Class B amplifier.

22. (Original) A method for reducing noise in an output audio signal during power-off of an audio amplifier device comprising an audio amplifier and a supply voltage rejection circuit, the audio amplifier device including a first input for receiving an input audio signal, a second input for receiving a supply voltage, a third input for receiving a supply voltage rejection signal for the supply voltage rejection circuit, and an output for providing the output audio signal, the method comprising:

turning off the power supply for powering-off the audio amplifier device;

dividing the supply voltage into a divided supply voltage; and

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setting the supply voltage rejection signal equal to the divided supply voltage during power-off so that a rate of decrease of the supply voltage is greater than a rate of decrease of the supply voltage rejection signal.

23. (Currently Amended) A method according to Claim 22 wherein the supply voltage rejection circuit comprises at least one transistor having a conducting voltage; and wherein the rate of decrease of the supply voltage ~~is greater than~~ and the rate of decrease of the supply voltage rejection signal causes an instantaneous supply voltage to be greater than an instantaneous supply voltage rejection signal by at least the conducting voltage.

24. (Original) A method according to Claim 22 wherein setting the supply voltage rejection signal equal to the divided supply voltage during power-off is performed using a power-off noise suppression circuit that includes a first input receiving the divided supply voltage, an output providing the supply voltage rejection signal, and a second input connected to the output so that the power-off noise suppression circuit is configured as a voltage follower.

25. (Currently Amended) A method according to Claim 24 wherein the power-off noise suppression circuit comprises:
a pair of first and second transistors each comprising a first conduction terminal connected to the power supply, the first transistor comprising a control terminal connected to the first input of the power-off noise suppression circuit and the second transistor comprising a

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control terminal connected to the third input of the audio amplifier for providing the supply voltage rejection signal; and

a device connected to the pair of first and second transistors and being operated ~~when so that the divided supply voltage is greater than the~~ supply voltage rejection signal ~~during power off so that the supply voltage rejection signal~~ is set equal to the divided supply voltage.

26. (Currently Amended) A method according to Claim 25 further comprising biasing the ~~switch~~ device.

27. (Currently Amended) A method according to Claim 25 wherein the ~~switch~~ device comprises a transistor.

28. (Original) A method according to Claim 22 wherein the audio amplifier is a Class B amplifier.